

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04Q 7/38		A2	(11) International Publication Number: WO 99/35869
			(43) International Publication Date: 15 July 1999 (15.07.99)
(21) International Application Number: PCT/FI99/00010			(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 8 January 1999 (08.01.99)			
(30) Priority Data: 980036 9 January 1998 (09.01.98) FI			
(71) Applicant (for all designated States except US): SONERA OY [FI/FI]; Teollisuuskatu 15, FIN-00510 Helsinki (FI).			
(72) Inventors; and (75) Inventors/Applicants (for US only): KESKI-HEIKKILÄ, Mika [FI/FI]; Sonera Oy, P.O. Box 049, FIN-00051 Sonera (FI). LINKOLA, Janne [FI/FI]; Kuusikallionkuja 4 F 43, FIN-02210 Espoo (FI). HOKKANEN, Tuomo [FI/FI]; Strömsinlahdenkuja 2 A 13, FIN-00820 Helsinki (FI).			
(74) Agent: PAPULA REIN LAHTELA OY; (Fredrikinkatu 61 A), P.O. Box 981, FIN-00101 Helsinki (FI).			

Published

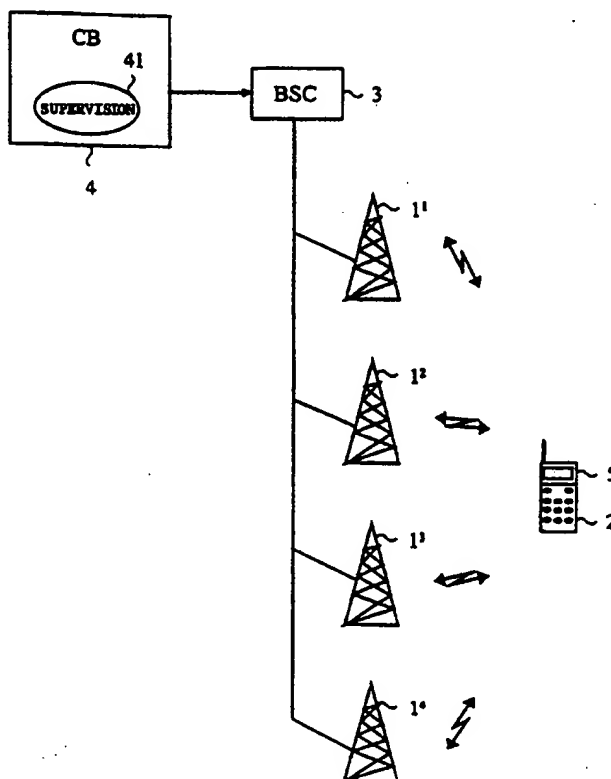
In English translation (filed in Finnish).

Without international search report and to be republished upon receipt of that report.

(54) Title: METHOD AND SYSTEM FOR CHANGING SUBSCRIBER PROFILE BASED ON IDENTITY OF BASE STATION SERVING THE TERMINAL EQUIPMENT

(57) Abstract

The present invention relates to a method for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network. Moreover, the invention relates to a system for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network. According to the present invention, an extra identity of a permanent nature is created for each base station, and this identity is sent by the base station to the subscribers in its area. Changing the subscriber profile on the basis of subscriber movements is accomplished flexibly and considerably more easily and at a lower cost than before.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav	TM	Turkmenistan
BF	Burkina Faso	GR	Greece		Republic of Macedonia	TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

METHOD AND SYSTEM FOR CHANGING SUBSCRIBER PROFILE BASED
ON IDENTITY OF BASE STATION SERVING THE TERMINAL
EQUIPMENT

The present invention relates to a method as
5 defined in the preamble of claim 1 for changing a sub-
scriber profile based on the identity of the base sta-
tion serving the terminal equipment. Moreover, the in-
vention relates to a system as defined in the preamble
of claim 4 for changing a subscriber profile based on
10 the identity of the base station serving the terminal
equipment.

In the near future it is to be expected that
there will be a growing demand for various applications
and services that need the identity of the base station
15 serving the terminal equipment in mobile communication
networks. Based on subscriber movements, the subscriber
profile can be modified, e.g. by limiting/extending
services or changing applications, depending on the
cell in whose area the subscriber is currently located.
20 An example of this is the home cell pricing policy, ac-
cording to which the subscriber's calls are charged for
at a reduced rate when the terminal equipment is within
the area of so-called home cells.

In present mobile communication systems, how-
25 ever, changing the subscriber profile on the basis of
base station identity is difficult. This is because
base stations do not have a permanent identity (for a
period of months - years). The CGI information (Cell
Global Identity, CGI) transmitted in the BCCH channel
30 (Broadcast Control Channel, BCCH) contains e.g. a cell
identifier, but in network reconfigurations the identi-
fiers occasionally have to be changed. Some of the
changes apply to only one base station at a time, so
applications and services could be designed to utilise
35 the identifiers of a plurality of base stations, in
which case changing the identifier of one of the base
stations would not necessarily confuse the application.

Other changes, such as BSC switch-over, apply to a large number of base stations at a time, so in this case the above-mentioned technique of monitoring a plurality of base stations is not applicable. In short,
5 designing and constructing a system for changing the subscriber profile on the basis of base station identity is at present either impossible or at least very expensive.

The object of the present invention is to disclose
10 a new type of method and system to eliminate the drawbacks described above.

A specific object of the invention is to disclose a method for changing the subscriber profile on the basis of the identity of the base station serving
15 the terminal equipment in a mobile communication network. A further object of the invention is to disclose a system for changing the subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network.

20 As for the features characteristic of the invention, reference is made to the claims.

In the method of the present invention for changing the subscriber profile on the basis of the identity of the base station serving the terminal
25 equipment in a mobile communication network, information signals are sent by each base station and the information signals are received by the terminal equipment, which comprises a mobile station provided with a subscriber identity module. A permanent base station
30 identity is included in the information signals sent by each base station, and the subscriber profile is changed on the basis of the permanent identity of the base station serving the terminal equipment.

As compared with prior art, the present invention
35 tion provides the advantage that a more stable extra identity is created for each base station, and this identity is sent by the base station to the subscribers

in its area. Thus, each terminal device is at all times informed as to the base station in whose area it is currently located. The base station identity is not changed in conjunction with network reconfiguration as
5 in prior-art solutions. Therefore, changing the subscriber profile on the basis of subscriber movements is accomplished flexibly and considerably more easily and at a lower cost than before.

In an embodiment of the method, information
10 signals are transmitted in the cell broadcast channel (CBCH) or some other channel suited for the purpose.

In an embodiment of the method, the mobile communication network is based on digital technology, such as GSM technology, DCS1800 technology or equivalent.

15 The system of the invention for changing the subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network comprises a base station which sends information signals and terminal equipment comprising a mobile station provided with a subscriber
20 identity module, said information signals being received by the mobile station. According to the invention, the system comprises means for including a permanent base station identity in the information signals sent by each base station. Moreover, according to the
25 invention, the terminal equipment comprises means for changing the subscriber profile on the basis of the permanent identity of the base station serving the terminal equipment.

30 In an embodiment of the system, the information signals are transmitted in the cell broadcast channel (CBCH) or in some other channel suited for the purpose.

In an embodiment of the system, the mobile communication network is based on digital technology, such
35 as GSM technology, DCS1800 technology or equivalent.

In the following, the invention will be described by the aid of a few examples of its embodiments by referring to the attached drawing, wherein

Fig. 1a presents a system according to the present invention;

Fig. 1b presents a system according to the present invention.

The mobile communication system presented in Fig. 1a, which in this example is a system based on GSM technology, comprises four base stations 1¹, 1², 1³ and 1⁴. The base stations are connected to a base station controller (BSC) 3, which again is connected to a cell broadcast (CB) server 4. Implemented in the cell broadcast server 4 is supervision software 41, which is used to create an extra identity of permanent nature for each one of the base stations 1¹, 1², 1³ and 1⁴. In practice, the identity may consist of e.g. a sequence number. The supervision software 41 and the base station controller 3 see to it that the identity assigned to each base station 1¹, 1², 1³ and 1⁴ is included in the information signal sent by the base station. Moreover, the supervision software 41 and the base station controller 3 take care of preserving the same identity for each base station after changes made in the network. The base stations 1¹, 1², 1³ and 1⁴ send the information signals e.g. in the cell broadcast channel (CBCH).

Furthermore, Fig. 1a shows a terminal 2, which forms an essential part of the system. The system may comprise an almost unlimited number of terminals. The terminal equipment comprises a mobile station provided with a subscriber identity module. Moreover, the terminal equipment 2 comprises means 5 for changing the subscriber profile on the basis of the identity of the base station currently serving the terminal. These means 5 may consist of e.g. software implemented in the subscriber identity module and/or a separate device

connected to the mobile station. They are used to receive the information signal and with it the permanent identity of the base station serving the terminal equipment. Subscriber profile changes are made on the basis of the permanent identity. A change in subscriber profile may consist of e.g. lower call charges if the subscriber remains within the area of predetermined home cells.

Fig. 1b presents a system corresponding to that in Fig. 1a after BSC switch-over. In BSC switch-over, which is a network reconfiguration procedure commonly used in mobile communication systems, base stations 6¹, 6², 6³ and 6⁴ originally controlled by a single base station controller are allotted to several base station controllers 8, 9. In prior-art implementations, this changes the base station identities, whereas the identity according to the invention remains the same, this being taken care of by the supervision software 101 implemented in the cell broadcast server 10 and the base station controllers 8 and 9. The terminal equipment 7 comprises means 11 for changing the subscriber profile on the basis of the identity of the mobile station currently serving the terminal equipment, as in the previous example.

The invention is not restricted to the examples of its embodiments described above, but many variations are possible within the scope of the inventive idea defined by the claims.

CLAIMS

1. Method for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network, in which method information signals are sent by the base station and the information signals are received by the terminal equipment, which comprises a mobile station provided with a subscriber identity module, characterised in that
- 5 - a permanent base station identity independent of configuration changes in the mobile communication network is included in the information signals sent by the base station;
- 10 - and the subscriber profile is changed on the basis of the permanent base station identity.
2. Method as defined in claim 1, characterised in that the information signals are transmitted in the cell broadcast channel (CBCH).
3. Method as defined in claim 1 or 2, characterised in that the mobile communication network is based on digital technology, such as the GSM technology.
- 20 4. System for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network, said system comprising a base station ($1^1, \dots, 1^n$) which sends information signals and terminal equipment (2) which comprises a mobile station provided with a subscriber identity module and receives the information signals, characterised in that
- 25 - the system comprises means (3, 4, 41) for including in the information signals a permanent identity of the base station ($1^1, \dots, 1^n$) which is independent of configuration changes in the mobile communication network; and
- 30 - the system comprises means (3, 4, 41) for including in the information signals a permanent identity of the base station ($1^1, \dots, 1^n$) which is independent of configuration changes in the mobile communication network; and
- 35 - the system comprises means (3, 4, 41) for including in the information signals a permanent identity of the base station ($1^1, \dots, 1^n$) which is independent of configuration changes in the mobile communication network; and

- the terminal equipment (2) comprises means (5) for changing the subscriber profile on the basis of the permanent identity of the base station ($1^1, \dots, 1^n$).

5 5. System as defined in claim 4, characterised in that the information signals are transmitted in the cell broadcast channel (CBCH).

6. System as defined in claim 4 or 5, characterised in that the mobile communication network is based on digital technology, such as GSM
10 technology.

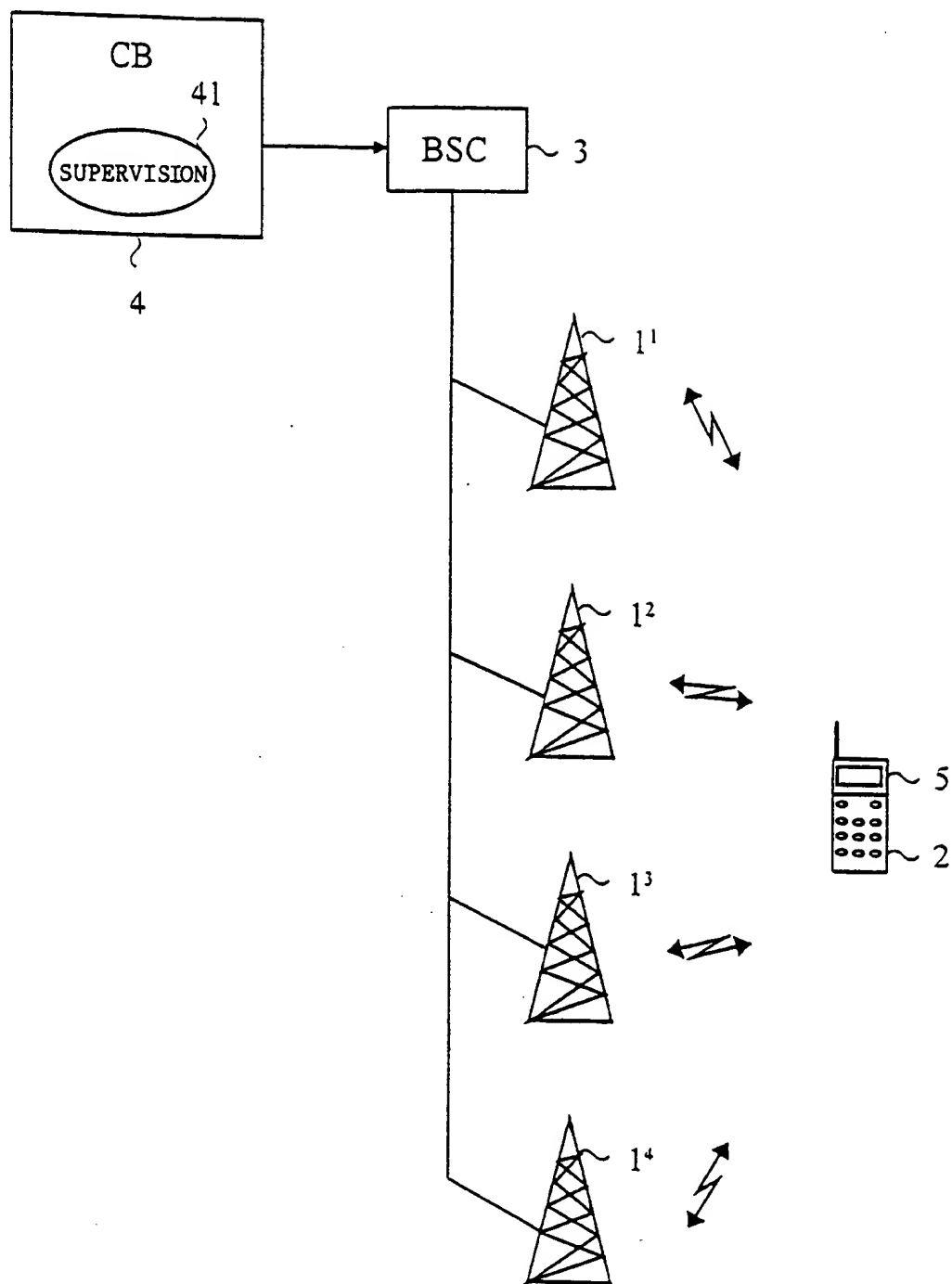


Fig. 1a

2/2

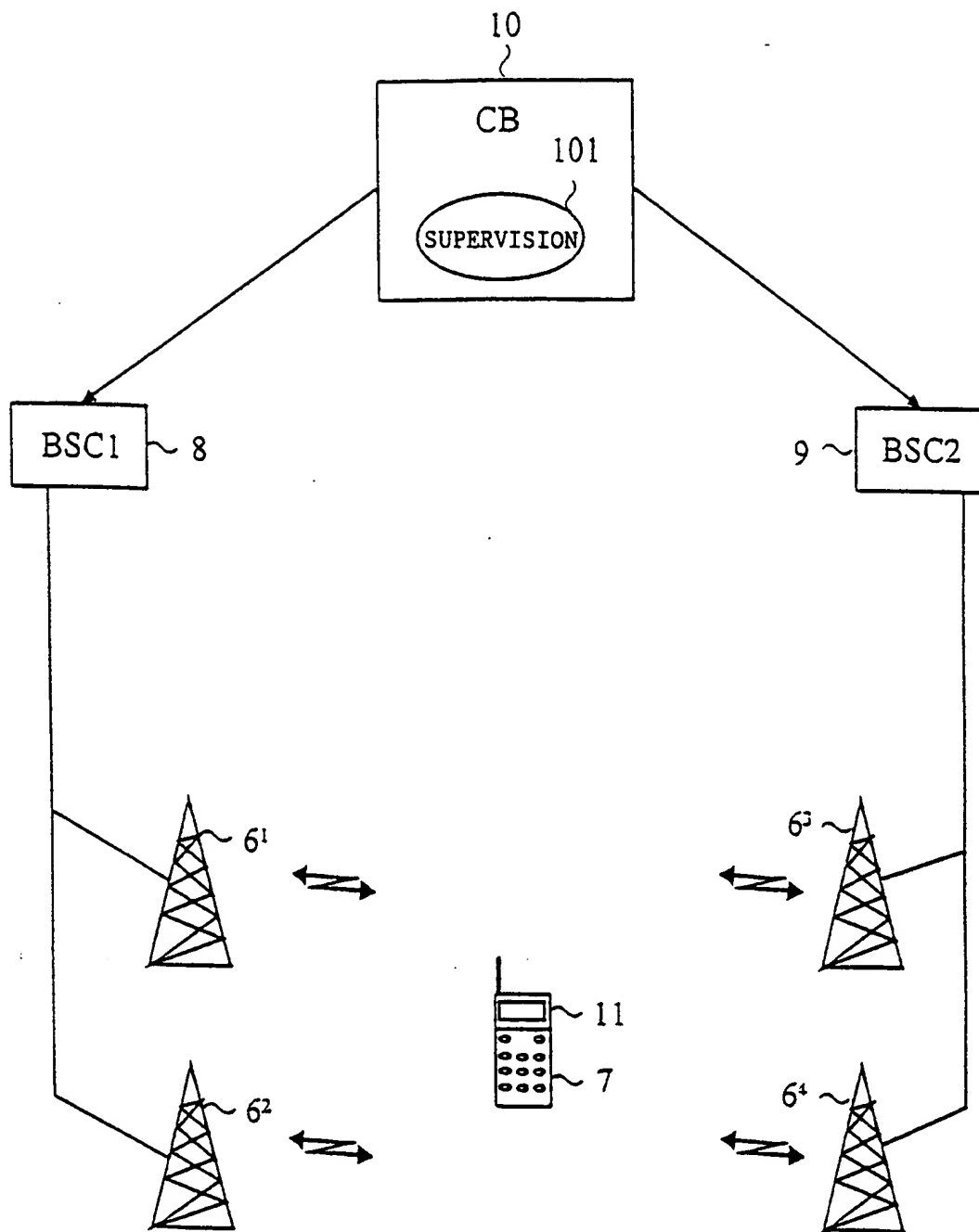


Fig. 1b

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



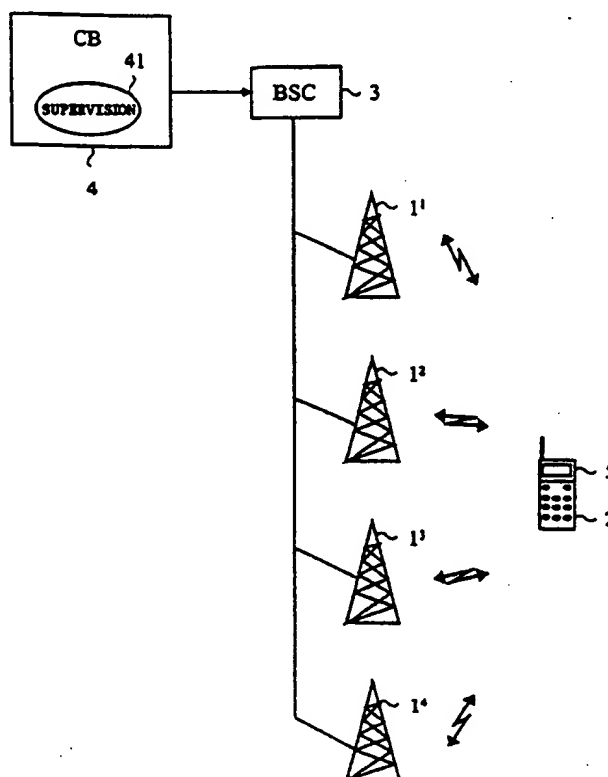
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04Q 7/38		A3	(11) International Publication Number: WO 99/35869
			(43) International Publication Date: 15 July 1999 (15.07.99)
(21) International Application Number: PCT/FI99/00010		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 8 January 1999 (08.01.99)			
(30) Priority Data: 980036 9 January 1998 (09.01.98) FI			
(71) Applicant (for all designated States except US): SONERA OY [FI/FI]; Teollisuuskatu 15, FIN-00510 Helsinki (FI).			
(72) Inventors; and			
(75) Inventors/Applicants (for US only): KESKI-HEIKKILÄ, Mika [FI/FI]; Sonera Oy, P.O. Box 049, FIN-00051 Sonera (FI). LINKOLA, Janne [FI/FI]; Kuusikallionkuja 4 F 43, FIN-02210 Espoo (FI). HOKKANEN, Tuomo [FI/FI]; Strömsinlahdenkuja 2 A 13, FIN-00820 Helsinki (FI).		Published With international search report. In English translation (filed in Finnish).	
(74) Agent: PAPULA REIN LAHTELA OY; (Fredrikinkatu 61 A), P.O. Box 981, FIN-00101 Helsinki (FI).		(88) Date of publication of the international search report: 16 September 1999 (16.09.99)	

(54) Title: METHOD AND SYSTEM FOR CHANGING SUBSCRIBER PROFILE BASED ON IDENTITY OF BASE STATION SERVING THE TERMINAL EQUIPMENT

(57) Abstract

The present invention relates to a method for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network. Moreover, the invention relates to a system for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network. According to the present invention, an extra identity of a permanent nature is created for each base station, and this identity is sent by the base station to the subscribers in its area. Changing the subscriber profile on the basis of subscriber movements is accomplished flexibly and considerably more easily and at a lower cost than before.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav	TM	Turkmenistan
BF	Burkina Faso	GR	Greece		Republic of Macedonia	TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 99/00010

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04Q 7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5434798 A (MONICA B. K. MADEBRINK ET AL), 18 July 1995 (18.07.95), column 3, line 1 - line 9, see claims column 17-22 --	1,3
A	WO 9711569 A1 (TELEFONAKTIEBOLAGET LM ERICSSON), 27 March 1997 (27.03.97), page 9 - page 11, see claims page 17-20 --	1,3
A	US 5295180 A (DINO J. VENDETTI ET AL), 15 March 1994 (15.03.94), column 1, line 24 - line 29; column 3, line 3 - line 6, see claims column 13-18 --	1-6

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document but published on or after the international filing date	"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

22 June 1999

Date of mailing of the international search report

24 -06- 1999

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Peter Hedman/MN
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 99/00010

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0597638 A1 (VODAFONE LIMITED), 18 May 1994 (18.05.94), claims 1-6 -- -----	1-6

INTERNATIONAL SEARCH REPORT
Information on patent family members

01/06/99

International application No.

PCT/FI 99/00010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5434798 A	18/07/95	EP 0540718 A JP 6502290 T WO 9221182 A	12/05/93 10/03/94 26/11/92
WO 9711569 A1	27/03/97	AU 7005096 A CN 1202297 A EP 0852101 A US 5754955 A	09/04/97 16/12/98 08/07/98 19/05/98
US 5295180 A	15/03/94	CA 2083791 A EP 0568824 A JP 6105364 A US 5600706 A US 5758288 A	09/10/93 10/11/93 15/04/94 04/02/97 26/05/98
EP 0597638 A1	18/05/94	AU 5056893 A GB 2272607 A	26/05/94 18/05/94